Claims 1-38 are pending in this application, of which Claims 24 and 33-38 have been amended. Claims 1-38 stand rejected.

The rejection of Claims 1-9, 11-12, 14-15, 25-28, and 30-31 under 35 U.S.C. § 103 as being unpatentable over Livshutz et al. (U.S. Patent No. 6,112,200) in view of Israni et al. (U.S. Patent No. 6,308,177) is respectfully traversed. The rejection of Claims 10 and 29 under 35 U.S.C. § 103 as being unpatentable over Livshutz et al. in view of Israni et al. and further in view of Moroto et al. (U.S. Patent No. 4,943,925) is also respectfully traversed. Also, the rejection of Claims 13 and 32 under 35 U.S.C. § 103 as being unpatentable over Livshutz et al. in view of Israni et al. and further in view of Nomura et al. (U.S. Patent No. 6,421,659) is respectfully traversed. In addition, the rejection of Claims 16-17, 19-20, 22-23, 33-35, and 37 under 35 U.S.C. § 103 as being unpatentable over Tanimoto et al. (U.S. Patent No. 6,256,579) in view of Nomura et al. (U.S. Patent No. 5,371,678) and further in view of Nomura et al. ('659) is also respectfully traversed. Finally, the rejection of Claims 18, 21, 24, 36, and 38 under 35 U.S.C. § 103 as being unpatentable over Tanimoto et al. ('579) in view of Nomura et al. ('678) and Nomura et al. ('659) and further in view of Tanimoto et al. (U.S. Patent No. 6,263,277) is respectfully traversed.

Claim 1 recites a method for organizing roadway network data in a memory storage device. The method comprises "providing a data set indicative of a roadway network," "identifying proximity criteria for intersections between roads in said roadway network, wherein each of said intersections is indicative of a node," "grouping said nodes into a node block based on said proximity criteria" and "storing node records containing data indicative of said nodes, said node records being stored as a group in said node block in contiguous memory."

Applicants submit that the combined teachings of Livshutz et al. and Israni et al. do not render obvious, among other things, the claimed grouping step and the claimed storing step.

Livshutz et al. describe a navigation system (10) including a CPU (12) connected to a drive (14), a storage device (16) on which is stored a navigation application software program (18), and a user interface (31). The navigation may also include a positioning system (24) (i.e.

GPS). Navigation system (10) further includes a map database (40) stored on a medium (32) that can be installed within drive (14). Database (40) includes node data and road segment data. The individual node data records includes "attributes" and "fields" that allow identification of the road segment(s) which connect to it and it geographic position in latitude and longitude coordinates. To store the data more efficiently, Livshutz et al. describe organizing the geographic data in layers (higher and lower levels of detail), spatially (by physical location), and parcels of spatially organized geographic data.

Israni et al. describe a navigation system (10) including a CPU (12) connected to a drive (14), a storage device (16) on which is stored a navigation application software program (18), and a display (27). The navigation system may also include a positioning system (24) (i.e. GPS). Navigation system (10) further includes a map database (40) stored on a medium (22) that can be installed within drive (14). Database (40) includes node data and road segment data. The individual node data records includes "attributes" and "fields" that allow identification of the road segment(s) which connect to it and it geographic position in latitude and longitude coordinates. Israni et al. further describe defining a geographic data set utilizing nodes (102) which define a minimum bounding rectangle (106).

Livshutz et al. and Israni et al. do not describe nor suggest methods which include identifying proximity criteria for intersections between roads and further do not describe nor suggest the grouping of nodes into node blocks based on the proximity data. Rather, Livshutz et al. and Israni et al. describe systems for providing geographic data for individual nodes, and utilization of nodes to define boundaries of geographic areas. Nothing in Livshutz et al. nor Israni et al. concerns identification of proximity criteria or grouping of nodes based on proximity criteria. Therefore, Claim 1 is submitted to be patentable over Livshutz et al. in view of Israni et al.

Independent Claim 25 recites a data structure embodied on a computer readable medium for defining a roadway network having road segments intersecting at nodes. The data structure comprises "node records containing data indicative of corresponding nodes in a roadway

network, a first node record corresponding to a first node and containing adjacency information indicative of an estimated location of adjacent nodes directly connected to said first node, said estimated location being determined with respect to said first node."

Livshutz et al. in view of Israni et al. do not describe nor suggest a data structure which includes node records that contain adjacency information indicative of an estimated location of adjacent nodes. Instead, Livshutz et al. and Israni et al. describe systems for providing geographic data for individual nodes, and utilization of nodes to define boundaries of geographic areas. Therefore, Claim 25 is submitted to be patentable over Livshutz et al. in view of Israni et al.

Further, it is submitted that Claims 10 and 29 are neither anticipated, nor rendered obvious, by Livshutz et al., Israni et al., or Moroto et al.

Moroto et al. describe a navigation processing unit (4) which is communicatively coupled to an input unit (1), an output unit (5), road system data (6), and navigation data (7). Further, Moroto et al. appear to describe a road selection validation method which utilizes a vehicle location, orientation, steering angle, and data relating to the bending angle of each road leading out of an intersection to determine which of the roads out of the intersection the driver has taken.

Claim 10 recites a step for identifying an outgoing bearing and a straight line bearing between two nodes in a data set. Claim 29 recites a data structure where node records include fields indicative of outgoing and straight line bearings between two nodes. Nothing in Livshutz et al., Israni et al., or Moroto et al. concerns determination of outgoing and straight line bearing between nodes.

Still further, it is submitted that Claims 13 and 32 are neither anticipated, nor rendered obvious, by Livshutz et al., Israni et al., or Nomura et al.

Nomura et al. describe a current position detection apparatus (1) that detects a current position of a vehicle utilizing an azimuth sensor, a vehicle speed sensor, and a GPS sensor. A map database apparatus (8) manages road data by expressing the road data as link strings, the

connection points between individual links being nodes. Certain nodes appear in numerous link strings. Nomura et al. describe what might be referred to as a memory management scheme where data regarding identified nodes, which may appear in multiple link strings, includes an offset in memory to memory locations where the data regarding an individual node is stored.

Claim 13 recites a step of identifying a relative offset between a geographic location of a first node in a node block and a geographic center associated with the node block. Claim 32 recites a data structure which includes a field containing data indicative of a relative offset between geographic coordinates of each node and a predefined reference point within a roadway network. Nothing in Livshutz et al., Israni et al., or Nomura et al. concerns predefined geographic centers or predefined reference points.

Independent Claim 16 recites a method for calculating a navigation route between first and second geographic locations. The method comprises "providing a data set comprised of node blocks of data, said data indicative of a roadway network of roads intersecting at intersection nodes, wherein said data includes proximity criteria indicative of said intersection nodes," "accessing a first node record including data indicative of a first geographic location, said first node record included in a first node block" and "calculating a bearing direction from said first geographic location towards a second geographic location based on said proximity criteria included in said first node block." The method further comprises "accessing one of a header or footer included in said first node block, said header or footer including common feature data indicative of traffic characteristics for said roads" and "accessing a second node record included in said first node block, said second node record including data indicative of a navigation route, said navigation route contiguous from said first node record."

Tanimoto ('579) describe a navigation controller (1) that receives signals from input sensors (3) (i.e. speedometer, gyro, GPS) and includes a map data memory (4) and a display (5). Controller plans a travel route consisting of a series of links that at connected at nodes. Each planned route has a cost (i.e. estimated travel time) associated with it and if the driver chooses to

deviate from the planned route, navigation controller (1) re-costs the route to the destination based on the deviation. Different routes that have been taken are stored in a history table.

Nomura ('678) describe a system and method that is capable of searching various routes of travel according to a predicted time during which the route will be traversed. The system includes a storage block (13) of a fixed regional road map, a set input block (15) into which a starting point and destination can be entered, a storage block (17) which include road specific data (e.g. one way street), and a calculation block (23) which predicts when the traveler will pass through each node of the route. A route searching block (25) determines the routes the traveler should take and a monitoring block (29) updates the previous predictions based on a timer (51) and data on vehicle position.

Tanimoto ('579), Nomura ('678) and Nomura ('659) do not describe nor suggest a method for calculating a navigation route which includes calculating a bearing direction from a first geographic location towards a second geographic location based on proximity criteria included in a first node block or which includes accessing one of a header or footer included in the first node block, the header or footer including common feature data indicative of traffic characteristics for said roads. Instead, Tanimoto ('579), Nomura ('678) and Nomura ('659) describe systems for planning travel routes that are updated based on travel conditions encountered on individual road elements along the route. Impacts in relation in arriving at the destination are updated automatically if the traveler deviates from the planned route. Therefore, Claim 16 is submitted to be patentable over Tanimoto ('579) in view of Nomura ('678) and Nomura ('659).

Independent Claim 33 recites a navigation system that comprises "a first memory storing data sets indicative of roadway networks, said data sets stored in blocks of data wherein said blocks of data include geographical data indicative of nodes, said nodes being proximately located, said blocks of data including at least one bearing component associated with at least one node," "a second memory storing at least one said blocks of data temporarily," "a route calculation module calculating a planned route over the roadway network between source and

destination locations based on the data stored in the second memory" and "a display displaying said route calculated by said route calculation module."

Tanimoto ('579), Nomura ('678) and Nomura ('659) do not describe nor suggest a navigation system which includes node records having a distance component and at least one bearing component associated with at least one adjacent node. Instead, Tanimoto ('579), Nomura ('678) and Nomura ('659) describe systems for planning travel routes that are updated based on travel conditions encountered on individual road elements along the route. Therefore, Claim 33 is submitted to be patentable over Tanimoto ('579) in view of Nomura ('678) and Nomura ('659)

Further, it is submitted that Claims 18, 21, 24, 36 and 38 are neither anticipated, nor rendered obvious, by Tanimoto ('579), Nomura ('678), Nomura ('659), or Tanimoto et al. ('277).

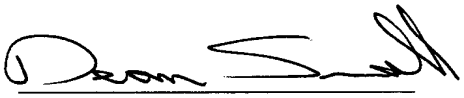
Tanimoto et al. ('277) describe a route searching method to search out a route leading to a destination. Map information is produced by having nodes on both ends of a link, the length of the link, the speed limit in the link, and the functional class of the link included in the link information. In making the route search, the speed limit in the link is corrected on the basis of the straight line distance to the destination and the functional class of the link, the time for traveling a link is calculated on the basis of the corrected speed limit and the link length, and the route minimizing the time required for reaching a destination is searched out on the basis of the link passing time. The functional class is determined using road factors such as the width, speed limit, and type of the road.

For example, Claim 18 recites that proximity criteria includes at least one of a latitude coordinate and a longitude coordinate for each node block. In another example, Claim 24 recites that a node block comprises a group of node records based on proximity criteria. Nothing in Tanimoto ('579), Nomura ('678), Nomura ('659), or Tanimoto et al. ('277) concerns proximity criteria.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of the Claims be withdrawn.

In view of the foregoing remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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APPENDIX A

SUBMISSION OF MARKED UP CLAIMS

IN THE CLAIMS

24. (once amended) The method of claim 16, wherein each said node block further comprising a group of node records based on said proximity criteria[data].

33. (once amended) A navigation system comprising:

a first memory storing data sets indicative of roadway networks, said data sets stored in blocks of data wherein said blocks of data include geographical data indicative of nodes, said nodes being proximately located, said blocks of data including at least one bearing component associated with at least one node;

a second memory storing at least one said blocks of data temporarily;

a route calculation module calculating a planned route over the roadway network between source and destination locations based on the data stored in the second memory; and

a display displaying said route calculated by said route calculation module.

34. (once amended) The [method]navigation system of claim 33, wherein said blocks of data include at least one of a block header and block footer comprising characteristic information describing at least one road segment feature descriptive of roadway segments leading to at least two nodes in said blocks of data.

35. (once amended) The [method]navigation system of claim 33, wherein said blocks of data include a plurality of said nodes in an equal plurality of said node records, said plurality of said node records stored in adjacent memory locations.

36. (once amended) The [method]navigation system of claim 33, wherein said blocks of data include a table associated with a plurality of node records stored in said blocks of data, said

table containing a list of features descriptive of road segments interconnecting said nodes, at least one node record containing an index into said table identifying a feature representative of a node associated with at least one node record.

37. (once amended) The [method]navigation system of claim 33, wherein said blocks of data include a plurality of said nodes in an equal plurality of said node records, said node records including a distance component [and at least one bearing component]associated with at least one adjacent node.

38. (once amended) The [method]navigation system of claim 33, wherein said blocks of data include a single latitude and a single longitude coordinate based on said geographical data indicative of said nodes.